NARUC/NREL Project
DG Staff Working Group

Model Distributed Generation Interconnection Procedures and Agreement

National Association of Regulatory Company Commissioners

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Figure, Exhibits and Reference Symbol:

Reference Symbol –

The "light bulb" symbol  indicates a point in the Model Interconnection Procedures where a State will have to make a regulatory decision. In most cases, the reader can refer to the ***Model DG Interconnection Procedures and Agreement User's Manual*** to further "shed light" on the subject mentioned in the text, based on the procedures and experience of other States.

Model Distribution Interconnection Procedures

Background: Generic Interconnection Procedures

These generic Model Procedures for Interconnection of Distributed Generation equipment ("Model Procedures") to a distribution-level electric power system are intended for consideration, adoption, or adaptation by State regulatory commissions, their counterparts in local units of government, or by rural electric cooperative organizations. Regulatory orders, resolutions, rules, ordinances, or local laws required for the adoption or adaptation of these model procedures and agreements will be left to the organizations seeking to use them. For that reason, no attempt is made to identify or recommend policy for such issues as price, cost responsibility for fees, studies or construction, rate or tax treatment or preference for generation type or size, which are subject to local conditions and regulatory determination.[1]

I. Scope and Purpose

The Model Procedures are designed to implement State distributed generation policy[2] that call for uniform interconnection standards that are not unduly burdensome or expensive, ensuring safety and system reliability. The Model Procedures define the terms and conditions governing the interconnection and parallel operation of a Customer's distributed generation ("DG") with a Company company's ("Company") electric distribution system.

The Model Procedures also describe the process and the information required to allow a Company to review the Customers' DG for interconnection in a reasonable and expeditious manner. The Model Procedures provide a framework for processing Customer's applications to:

- Interconnect new distributed generation facilities ("DG") with a nameplate rating of ___[3] or less (aggregated on the customer side of the Point Of Common Coupling) connected in parallel to non-network radial distribution; or

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[1] The "light bulb" symbol indicates a point in the Model Interconnection Procedures where a State will have to make a regulatory decision. In most cases, the reader can refer to the ***Model DG Interconnection Procedures and Agreement User's Manual*** to further "shed light" on the subject mentioned in the text, based on the procedures and experience of other States.

[2] Based on State or local law, State regulatory commission rules or orders, or similar initiative.

[3] Each state will make its own decision regarding size of the nameplate threshold. In some states the threshold may be as low as 300 KVA, while other states' thresholds may be as high as 10 MW.

- Review any system impact or facility studies and/or Company construction required to interconnect new DG larger than the State Commission-approved threshold, or to interconnect the DG to large urban secondary network distribution facilities in the Company system, or where the interconnection of the DG could create a significant impact on the system's circuit duty, fault detection sensitivity and protection device coordination schemes.

- **Eligibility** – Only DG designed to operate, or operating, in parallel with the Company's electrical system is subject to these procedures.

  The Company must provide the Customer with the technical interconnection requirements adopted for use by the State regulatory commission.[4]

- **Timelines** - The time required to complete the application process may be affected by the complexity of the proposed DG and the location of the proposed installation site. Projects using pre-certified equipment may be expedited by a "fast track" through the application process. Customers submitting pre-certified equipment, however, are not exempt from providing the Company with complete application packages necessary for review by the Company.

- **Company Responsibilities** - The application process and services must be offered on a non-discriminatory basis. The Company must clearly identify its costs related to the Customers' interconnections, specifically those costs the Company would not have incurred but for the Customers' interconnections.

  Authorization of Company fees as well as rate treatment or allocation of Company costs for rate making purposes is left to the discretion of the State regulatory commission. The Companies will keep a log of all Customers' applications, milestones met, and justifications for application-specific requirements.

II. Definitions

The meaning of the terms used in the Model Procedures shall be defined by the definitions found in Exhibit B: Glossary of Terms, appended to the Model Procedures

III. Application Process Steps

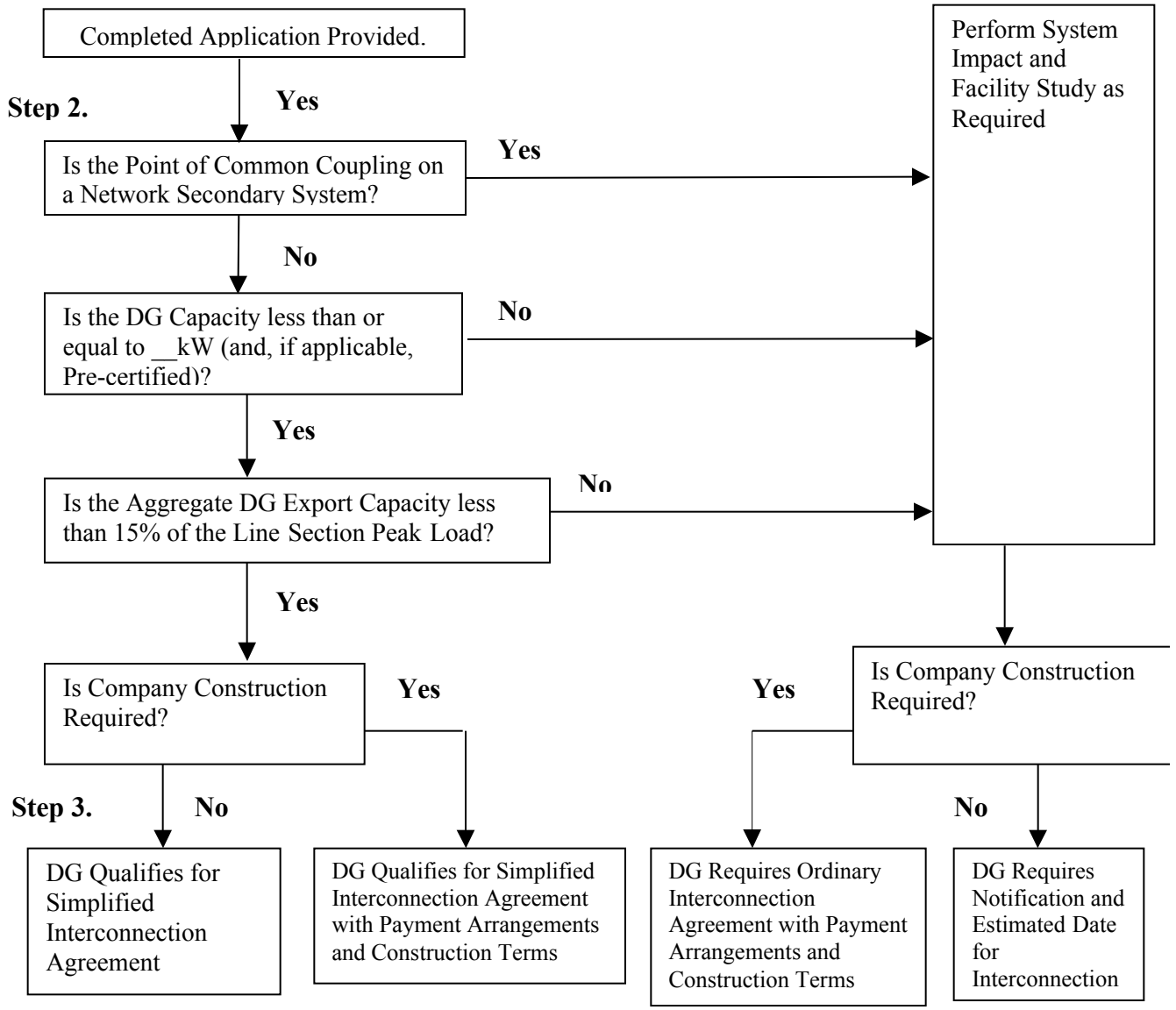
The application process for interconnection of DG to the electric distribution system involves the following steps:

[4] Certain States have developed and prescribed their own State technical requirements that may also include standards for pre-certification of certain equipment prior to installation. National safety and performance standards are established by the National Electrical Code and the Underwriters Laboratories. As of this writing, the Institute of Electric and Electronics Engineers standards for interconnection of distributed resources to electric power distribution systems had not yet achieved consensus among the IEEE Standards Committee participants.

Figure.

INTERCONNECTION REVIEW PROCESS

Fast-track Review Process: **Standard Review Process:**



Step 4. Construction

Step 5. Connection, Testing, and Operation

Step 1: Completed Application Provided.

A Customer seeking to physically connect DG to the Company's distribution system shall file a completed Interconnection Application.

The Company will provide all relevant applications forms, documents, and technical requirements for interconnection of DG. The Company will establish a single point of contact for the Customer to coordinate all matters relating to DG interconnection.

Step 2: Company Review of the Application.

Within 10 business days (or a timeframe as prescribed by the State regulatory commission) of receiving an application the Company shall acknowledge its receipt in writing and inform the Customer whether the application is complete. If the Company indicates that the application is incomplete, it shall specify the information needed to complete the application.

A completed application will be subject to one of two types of review:

- **Fast-track Review Process** – An application qualifies for Fast-track Review if the DG is pre-certified or is a small, low-impact DG project meeting the technical requirements as adopted by the State regulatory commission for interconnection to a radial distribution feeder.

  If the completed application provided by the Customer qualifies for Fast-track Review, the Company must complete its review of the application, and provide the Customer with a written description of the interconnection requirements for the project, as well as an Interconnection Agreement signed by the Company within four weeks (or the "fast track" timeframe prescribed by the State regulatory commission).

  Factors that will qualify or disqualify a DG project for Fast-track processing may include the following, as prescribed by the State regulatory commission:

  - Is the Point of Common Coupling on a Network Secondary Distribution System?
  - Is the DG capacity less than or equal to the State's size requirement or, if applicable, pre-certified?
  - Is the aggregate DG export capacity less than 15% of the line section peak load?
  - Is Company construction required?

- **Standard Review Process –** An application that does not qualify for Fast-track review will undergo a Standard Review. For example, DG that is not pre-certified may require a short circuit analysis as well as a line configuration screening to ensure that the DG will operate safely in parallel with the Company's system. Larger DG can have significant impacts on the Company's system. This is the reason that a comparison of the DG size to the load on the Company's system is important. In a Standard Review, the Company will conduct a system impact study and, if required, a facility study.

  The study must be completed by the Company in ____weeks for a radial connection, and ___weeks for a network interconnection.[5] Written results of the study must be presented to the Customer, detailing the findings and including a good-faith, detailed estimate of interconnection costs and capital upgrades required to the Company's system, if any.

  Companies must make reasonable efforts to accommodate DG projects, however, a Company can reject a DG project if it can demonstrate valid technical or safety reasons for denying the interconnection, but the Company must make good-faith efforts to resolve the issue with the Customer.

  For a Standard Review, the Customer is required to submit a detailed interconnection design package. The Customer shall provide to the Company:

  - Electrical schematic drawing(s) reflecting the complete DG interconnection design;

    (Some states require drawings to be signed by a licensed professional engineer or a licensed electrician.)

  - A complete listing of all devices used at the Point of Common Coupling. A set of specifications for this equipment proposed for installation shall be provided upon request from the Company.

  The Company will:

  - Conduct a review of the design package to ensure that the plans/design satisfy the minimum requirements for a safe and reliable interconnection and meet the technical requirements for interconnection;

[5] Regulatory verification of costs, cost allocation and cost responsibility as well as the setting of minimum or maximum deadlines for fast-track review and standard review studies will be determined by the State regulatory commission policy.

- Upon completion of the review, notify the Customer of the Company's final acceptance of the Customer's design or an explanation of the technical requirements the design fails to meet. In addition, this notice will include any site-specific test requirements applicable to interconnection equipment to be installed.

If the Company's review indicates that the project will require construction on or system upgrades of the Company's distribution system, the Company shall provide the Customer an estimate of the construction schedule and the Customer's cost for the construction or upgrades

Step 3: Interconnection Agreement.

Once the application has been approved, the Customer will execute the standardized Interconnection Agreement. If the project requires any construction by the Company, the agreement shall include a schedule for that construction.

Step 4: Project Construction.

The Customer will build and install the interconnection equipment and DG in accordance with the Company-accepted design.

The Company will commence construction/installation of any modifications required to its system and associated metering equipment identified in connection with its review of the application. Company system modifications will vary in construction time depending on the extent of work and equipment required. The schedule for this work shall be mutually agreed upon by the Parties and included in an appendix to the Interconnection Agreement.

Step 5: Connection, Testing and Operation.

Prior to operation, the DG and associated interconnection equipment shall be tested in accordance with procedures accepted by the State regulatory commission. If required, the Customer shall provide a written testing plan to the Company for review and acceptance. The testing shall include any Verification Testing procedure(s) provided by the manufacturer of the interconnection equipment. This testing plan will be designed to verify compliance of the DG and related interconnection equipment with the Customer's Company-accepted drawings. The final testing will be performed in accordance with applicable procedures and any site-specific requirements identified by the Company in its review of the application.

The final testing will be conducted at a mutually agreeable time, and the Company shall be given the opportunity to witness the tests. Prior to final testing, the Customer shall verify that the DG has been assembled and is in working order to the fullest extent possible (short of generating power while interconnected to the Company system).

The Customer's DG will be allowed to commence parallel operation upon satisfactory completion of the required tests. In addition, the Customer must have complied with and must continue to comply with all applicable contractual and technical requirements.

The Company will review the results of its on-site verification and within __days[6] after interconnection issue a formal letter of acceptance for interconnection to the Customer. At this time, the Company will also reconcile its actual costs related to the Customer's DG interconnection. The Customer will receive either a bill for any balance due or a reimbursement for overpayment of any Customer deposit as determined by the Company's reconciliation, in accordance with cost responsibility policy determined by the State regulatory commission.

IV. Dispute Resolution Procedures.

Each State regulatory commission should determine for itself how to handle disputes that arise at any step in this process.

V. Pre-Certification Testing.

Each State regulatory commission.should determine for itself how it will adopt pre-certification standards for specific DG technologies so as to enable these technologies to take advantage of the fast-track review process. A number of states have already developed such procedures.

VI. Technical Requirements.

States that have adopted DG Interconnection Procedures also have adopted detailed technical requirements. Each State regulatory commission should consider addressing such technical issues as prevention of power quality problems; disconnect switches; minimum power factor requirements; and metering, monitoring and telemetry requirements, including use of dedicated transformers.

[6] Deadlines for on-site verification and formal letters of acceptance are to be determined by the State regulatory commission policy.

Exhibit A.1

Summary and Description of Interconnection as found in the

STANDARIZED APPLICATION FOR SINGLE PHASE ATTACHMENT OF PARALLEL GENERATION EQUIPMENT 10 kW OR SMALLER TO THE ELECTRIC SYSTEM OF

Company:_____

DG Identification Number: _(Assigned by the Company)_

Customer:
Name: _____ Phone: (___)_____
Address:_____ Municipality: _____
_____

Customer's Electric Service Account Number: _(Assigned by the Company)__

Name and Address of the Customer as it appears on the Customer's electric bill from the Company:
Name: _____ Phone: (___)_____
Address:_____ Municipality: _____
_____

Consulting Engineer or Contractor:
Name: _____ Phone: (___)_____
Address:_____
_____

Estimated In-Service Date: _____

Existing Electric Service:
Capacity: _____Amperes Voltage: _____Volts
Service Character: ( )Single Phase ( )Three Phase

Location of Protective Interface Equipment on Property:
(include address if different from customer address)
_____

Energy Producing Equipment/Inverter Information:
Manufacturer: _____
Model No. _____ Version No. _____
( )Synchronous ( )Induction ( )Inverter ( )Other_____
Rating: _____kW Rating: _____kVA
Generator Connection: ( )Delta ( )Wye ( )Wye Grounded

Interconnection Voltage: _____Volts
DG System Type Tested (Total System): ( )Yes ( )No; attach product literature
Equipment Type Tested (i.e. Inverter, Protection System):
( )Yes ( )No; attach product literature
One Line Diagram attached: ( )Yes
Installation Test Plan attached: ( )Yes

Signature:

CUSTOMER SIGNATURE TITLE DATE

Exhibit A.2

Summary and Description of Interconnection as found in the

STANDARIZED APPLICATION FOR ATTACHMENT OF PARALLEL GENERATION EQUIPMENT _  _ kW OR SMALLER TO THE ELECTRIC SYSTEM OF

Company:_____

DG Identification Number: _(Assigned by the Company)_

Customer:
Name: _____ Phone: (___)_____
Address:_____ Municipality: _____
_____

Customer's Electric Service Account Number: _(Assigned by the Company)__

Name and Address of the Customer as it appears on the Customer's electric bill from the Company:
Name: _____ Phone: (___)_____
Address:_____ Municipality: _____
_____

Consulting Engineer or Contractor:
Name: _____ Phone: (___)_____
Address:_____
_____

Estimated In-Service Date: _____

Existing Electric Service:
Capacity: _____Amperes Voltage: _____Volts
Service Character: ( )Single Phase ( )Three Phase
Secondary 3 Phase Transformer Connection ( )Wye ( )Delta

Location of Protective Interface Equipment on Property:
(include address if different from customer address)
_____

Energy Producing Equipment/Inverter Information:
Manufacturer: _____
Model No. _____ Version No. _____

( )Synchronous ( )Induction ( )Inverter ( )Other_____
Rating: _____kW Rating: _____kVA
Rated Output: VA Rated Voltage: Volts
Rate Frequency: Hertz Rated Speed: RPM
Efficiency: % Power Factor: %
Rated Current: Amps Locked Rotor Current: Amps
Synchronous Speed: RPM Winding Connection:
Min. Operating Freq./Time:
Generator Connection: ( )Delta ( )Wye ( )Wye Grounded
System Type Tested (Total System): ( )Yes ( )No; attach product literature
Equipment Type Tested (i.e. Inverter, Protection System):
( )Yes ( )No; attach product literature
[Detailed] Diagram attached: ( )Yes
Installation Test Plan attached: ( )Yes

For Synchronous Machines:
Submit copies of the Saturation Curve and the Vee Curve
( )Salient ( )Non-Salient
Torque: _____lb-ft Rated RPM: _____
Field Amperes: _____ at rated generator voltage and current
and _____% PF over-excited
Type of Exciter: _____
Output Power of Exciter: _____
Type of Voltage Regulator: _____
Direct-axis Synchronous Reactance (Xd) _____ohms
Direct-axis Transient Reactance (X'd) _____ohms
Direct-axis Sub-transient Reactance (X"d) _____ohms

For Induction Machines:
Rotor Resistance (Rr)_____ohms Exciting Current ____Amps
Rotor Reactance (Xr)_____ohms Reactive Power Required:
Magnetizing Reactance (Xm)_____ohms ___VARs (No Load)
Stator Resistance (Rs)_____ohms ___VARs (Full Load)
Stator Reactance (Xs)_____ohms
Short Circuit Reactance (X"d)_____ohms Phases:
Frame Size: _____ Design Letter: ____ ( )Single
Temp. Rise: _____OC. ( )Three-Phase

For Inverters:
Manufacturer: Model:
Type: ( )Forced Commutated ( )Line Commutated
Rated Output: Amps Volts
Efficiency: %

Signature:

CUSTOMER SIGNATURE TITLE DATE

Exhibit B

Glossary of Terms and Technical References

Automatic Disconnect Device - An electronic or mechanical switch used to isolate a circuit or piece of equipment from a source of power without the need for human intervention.

Dedicated Service Transformer or Dedicated Transformer - A transformer with a secondary winding that serves only one customer.

Delivery Service means the services the Company may provide to deliver capacity or energy generated by Customer to a buyer to a delivery point(s), including related ancillary services.

Disconnect (verb) - To isolate a circuit or equipment from a source of power. If isolation is accomplished with a solid-state device; "Disconnect" shall mean to cease the transfer of power.

Disconnect Switch - A mechanical device used for isolating a circuit or equipment from a source of power**.**

Distributed Generation Equipment - Includes any on-site distributed generation facilities, self-generators, small electric generation facilities and electric customer-generators.

Islanding - A condition in which a portion of the Company system that contains both load and distributed generation is isolated from the remainder of the Company system. [Adopted from IEEE].

Point of Common Coupling (PCC): The point at which the interconnection between the electric Company and the customer interface occurs. Typically, this is the customer side of the Company revenue meter. [Adopted from IEEE 929-2000.]

Radial Feeder - A distribution line that branches out from a substation and is normally not connected to another substation or another circuit sharing the common supply.

Short Circuit Contribution – The result of dividing the maximum short circuit contribution of the distributed generator(s) by the short circuit contribution available from the Company system without distributed generator(s), converted to a percentage.

System Impact Study - Any studies performed by utilities or a designated third party to ensure that the safety and reliability of the electric grid with respect to the interconnection of distributed generation as discussed in this document.

Type Test - A test performed or witnessed once by a qualified independent testing

laboratory for a specific protection package or device to determine whether the equipment can be certified.

Company Grade Relay: A relay that is constructed to comply with, as a minimum, the most current version of the industry standards for non-nuclear Company facilities:

Verification Test: A test performed upon initial installation and repeated periodically to determine that there is continued acceptable performance.

Technical References:

IEEE C37.90.1 – IEEE Standard Surge Withstand Capability (SEC) Tests for Protective Relays and Relay Systems

IEEE C62.41 – Recommended Practices on Surge Voltages in Low Voltage AC Power Circuits

IEEE 62.45 – IEEE Guide on Surge Testing for Equipment Connected to Low-Voltage AC Power Circuits

IEEE 519 – Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems

IEEE 929 – IEEE Recommended Practice for Company Interface of Photovoltaic (PV) Systems

IEEE P1547 – Standard for Interconnecting Distributed Resources with Electric Power Systems (proposed)

UL 1741 – Inverters, Converters, and Controllers for Use in Independent Power Systems

NESC – The National Electric Safety Code provides the foundation by which utilities install electric power systems to meet safety guidelines. Many states require the utilities to comply with the NESC and other states have their own version of the NESC.

NEC – The National Electric Code establishes the safety standard for non-Company electrical systems. Many states and localities have their own variation of the NEC.

AGREEMENT FOR INTERCONNECTION AND PARALLEL OPERATION OF DISTRIBUTED GENERATION

This Interconnection Agreement ("Agreement") is made and entered into this _____ day of _____, 20__, by _____, "Company"), and _____ ("Customer") each hereinafter sometimes referred to individually as "Party" or both referred to collectively as the "Parties".

Customer Information:	**Company Information:**
Name: _____	Name: _____
Address: _____	Address: _____
Telephone: _____	Telephone: _____

DG Application No. _____

In consideration of the mutual covenants set forth herein, the Parties agree as follows:

1.0 Scope and Purpose of Agreement:

This Agreement describes *only* the conditions under which the Company and the Customer agree that the distributed generating facility or facilities ("DG") described in Exhibit A may be interconnected to and operated in parallel with the Company's Company system. Other services that the Customer may require from the Company will

be covered under separate agreements. The technical terms used in this agreement are defined in Exhibit B.

The following exhibits are specifically incorporated into and made a part of this Agreement:

Exhibit A: Summary and Description of Interconnection

Exhibit B: Technical Definitions

2.0 Summary and Description of Customer's Distributed Generation Equipment/Facility to be Included in Exhibit A:

A description of the Generating Facility, including a summary of its significant components and a diagram showing the general arrangement Customer's DG and loads that are interconnected with Company's electric distribution system, is attached to and made a part of this Agreement as Exhibit A.

2.1 DG identification number: _____ (Assigned by the Company)

2.2 Company's customer electric service account number: _____ (Assigned by Company)

2.4 Customer's name and address as it appears on the Customer's electric service bill from the Company:

_____

_____

_____

2.5 Capacity of the DG is: _____ kW.

2.6 The expected annual energy production of the DG is _____ kWh.

2.7 For the purpose of identifying eligibility of the Customer's DG for consideration under the federal Public Utility Regulatory Practices Act of 1978 ("PURPA"), and amendments, the Customer hereby declares that the DG __does/ __does not meet the requirements for "Cogeneration" as such term is used under applicable state rules or laws.

2.8 The DG's expected date of Initial Operation is _____.

The expected date of Initial Operation shall be within two years of the date of this Agreement.

3.0 Responsibilities of Distribution Company and Interconnection Service Customer

Each Party will, at its own cost and expense, operate, maintain, repair, and inspect, and shall be fully responsible for, the facility or facilities which it now or hereafter may own or lease unless otherwise specified in Exhibit A. Maintenance of Customer's DG and interconnection facilities shall be performed in accordance with the applicable manufacturer's recommended maintenance schedule.

The Parties agree to cause their facilities or systems to be constructed in accordance with specifications provided by the National Electrical Safety Code, the National Electric Code, and as approved by the American National Standards Institute, and interconnected in accordance with Institute of Electrical and Electronics Engineers standards where applicable.

Company and Customer shall each be responsible for the safe installation, maintenance, repair and condition of their respective lines and appurtenances on their respective sides of the Point Of Common Coupling. The Company or the Customer, as appropriate, shall provide interconnection facilities that adequately protect the Company's distribution system, personnel, and other persons from damage and injury. The allocation of responsibility for the design, installation, operation, maintenance and ownership of the interconnection Facilities shall be made part of this agreement as Exhibit C.

4.0 Prior Authorization

For the mutual protection of the Customer and the Company, the connections between the Company's service wires and the Customer's service entrance conductors shall not be energized without prior authorization of the Company, which authorization shall not be unreasonably withheld.

5.0 Warranty Is Neither Expressed Nor Implied

Neither by inspection, if any, or non-rejection, nor in any other way, does the Company give any warranty, express or implied, as to the adequacy, safety, or other characteristics of any structures, equipment, wires, appliances or devices owned, installed or maintained by the Customer or leased by the Customer from third parties, including without limitation the DG and any structures, equipment, wires, appliances or devices appurtenant thereto**.**

6.0 Liability Provisions

6.1 Limitation of Liability

Each Party's liability to the other Party for any loss, cost, claim, injury, liability, or expense, including reasonable attorney's fees, relating to or arising from any act or omission in its performance of this agreement, shall be limited to the amount of direct damage actually incurred. In no event shall either Party be liable to the other Party for any indirect, special, consequential, or punitive damages of any kind whatsoever.

6.2 Indemnification

a. Notwithstanding Paragraph 6.1 of this Agreement, the Company shall assume all liability for and shall indemnify the Customer for any claims, losses, costs, and expenses of any kind or character to the extent that they result from the Company's negligence in connection with the design, construction, or operation of its facilities as described on Exhibit A; provided, however, that the Company shall have no obligation to indemnify the Customer for claims brought by claimants who cannot recover directly from the Company. Such indemnity shall include, but is not limited to, financial responsibility for: (a) the Customer's monetary losses; (b) reasonable costs and expenses of defending an action or claim made by a third person; (c) damages related to the death or injury of a third person; (d) damages to the property of the Customer; (e) damages to the property of a third person; (f) damages for the disruption of the business of a third person. In no event shall the Company be liable for consequential, special, incidental or punitive damages, including, without limitation, loss of profits, loss of revenue, or loss of production. The Company does not assume liability for any costs for damages arising from the disruption

of the business of the Customer or for the Customer's costs and expenses of prosecuting or defending an action or claim against the Company. This paragraph does not create a liability on the part of the Company to the Customer or a third person, but requires indemnification where such liability exists. The limitations of liability provided in this paragraph do not apply in cases of gross negligence or intentional wrongdoing.

b. Notwithstanding Paragraph 6.1 of this Agreement, the Customer shall assume all liability for and shall indemnify the Company for any claims, losses, costs, and expenses of any kind or character to the extent that they result from the Customer's negligence in connection with the design, construction, or operation of its facilities as described on Exhibit A; provided, however, that the Customer shall have no obligation to indemnify the Company for claims brought by claimants who cannot recover directly from the Customer. Such indemnity shall include, but is not limited to, financial responsibility for: (a) the Company's monetary losses; (b) reasonable costs and expenses of defending an action or claim made by a third person; (c) damages related to the death or injury of a third person; (d) damages to the property of the Company; (e) damages to the property of a third person; (f) damages for the disruption of the business of a third person. In no event shall the Customer be liable for consequential, special, incidental or punitive damages, including, without limitation, loss of profits, loss of revenue, or loss of production. The Customer does not assume liability for any costs for damages arising from the disruption of the business of the Company or for the Company's costs and expenses of prosecuting or defending an action or claim against the Customer. This paragraph does not create a liability on the part of the Customer to the Company or a third person, but requires

indemnification where such liability exists. The limitations of liability provided in this paragraph do not apply in cases of gross negligence or intentional wrongdoing.

6.3 Force Majeure

If a Force Majeure Event prevents a Party from fulfilling any obligations under this Agreement, such Party will promptly notify the other Party in writing, and will keep the other Party informed on a continuing basis of the scope and duration of the Force Majeure Event. The affected Party will specify in reasonable detail the circumstances of the Force Majeure Event, its expected duration, and the steps that the affected Party is taking to mitigate the effects of the event on its performance. The affected Party will be entitled to suspend or modify its performance of obligations under this Agreement, other than the obligation to make payments then due or becoming due under this Agreement, but only to the extent that the effect of the Force Majeure Event cannot be mitigated by the use of reasonable efforts. The affected Party will use reasonable efforts to resume its performance as soon as possible.

7.0 Insurance

The Customer is not required to provide general liability insurance coverage as part of this Agreement, or any other Company requirement**.** Due to the risk of incurring damages, the [State Regulatory Commission] may recommend that every distributed generation Customer protect itself with insurance or other suitable financial instrument sufficient to meet its construction, operating and liability responsibilities pursuant to this Agreement At no time shall the Company require that the Customer negotiate any

policy or renewal of any policy covering any liability through a particular insurance company, agent, solicitor, or broker.

8.0 Effect

The inability of the Company to require the Customer to provide general liability insurance coverage for operation of the DG is not a waiver of any rights the Company may have to pursue remedies at law against the Customer to recover damages.

9.0 Severability

If any provision or portion of this Agreement shall for any reason be held or adjudged to be invalid or illegal or unenforceable by any court of competent jurisdiction, such portion or provision shall be deemed separate and independent, and the remainder of this Agreement shall remain in full force and effect.

10.0 Notices

Any written notice, demand, or request required or authorized in connection with this Agreement ("Notice") shall be deemed properly given if delivered in person or sent by first class mail, postage prepaid, to the person specified below:

If to Customer: Customer Name

Attention: _____

_____

_____

_____

Phone: ( ) _____

FAX: ( ) _____

If to Company: Company Name

Address: _____

City: _____

Phone: ( ) _____

FAX: ( ) _____

10.1 Notices

A Party may change its address for Notices at any time by providing the other Party Notice of the change in accordance with Section 10.0.

10.2 Communications

The Parties may also designate operating representatives to conduct the daily communications which may be necessary or convenient for the administration of this Agreement. Such designations, including names, addresses, and phone numbers may be communicated or revised by one Party's Notice to the other in accordance with Section 10.0.

11.0 Right of Access, Equipment Installation, Removal and Inspection

Upon reasonable notice, the Company may send a qualified person to the premises of the Customer at or immediately before the time the DG first produces energy to inspect the interconnection, and observe the DG's commissioning (including any required testing), startup, and operation for a period of up to no more than three days after initial start-up of

the unit. In addition, the customer shall notify the company at least seven (7) days prior to conducting any on-site Verification Testing of the DG.

Following the initial inspection process described above, at reasonable hours, and upon reasonable notice, or at any time without notice in the event of an emergency or hazardous condition, Company shall have access to Customer's premises for any reasonable purpose in connection with the performance of the obligations imposed on it by this Agreement or if necessary to meet its legal obligation to provide service to its customers.

12.0 Disconnection of Unit

Customer retains the option to temporarily disconnect from Company's Company system at any time. Such temporary disconnection shall not be a termination of the Agreement unless Customer exercises its termination rights under Section [13].

Subject to Commission Rule, for routine maintenance and repairs on Company's Company system, Company shall provide Customer with seven days' notice of service interruption. The Company shall have the right to disconnect service to Customer without notice to eliminate conditions that constitute a potential hazard to Company personnel or the general public. The Company shall notify the Customer of the emergency as soon as circumstances permit.

The Company may disconnect the DG, after notice to the Customer has been provided and a reasonable time to correct, consistent with the conditions, has elapsed, if the DG adversely affects the quality of service of adjoining customers.

If, after the DG has been commissioned, the operations of the Company are adversely affecting the performance of the DG or the Customer's premises, the Company shall immediately take appropriate action to eliminate the adverse effect. If the Company determines that it needs to upgrade or reconfigure its system the Customer will not be responsible for the cost of new or additional equipment on the Company's side of the Point Of Common Coupling between the Customer and the Company.

13.0 Effective Term and Termination Rights

This Agreement becomes effective when executed by both parties and shall continue in effect until terminated. The agreement may be terminated for the following reasons: (a) Customer may terminate this Agreement at any time, by giving the Company sixty days' written notice; (b) Company may terminate upon failure by the Customer to generate energy from the Facility in parallel with the Company's system by the later of two years from the date of this agreement or twelve months after completion of the interconnection; (c) either party may terminate by giving the other party at least sixty days prior written notice that the other Party is in default of any of the material terms and conditions of the Agreement, so long as the notice specifies the basis for termination and there is reasonable opportunity to cure the default; or (d) Company may terminate by giving Customer at least sixty days notice in the event that there is a material change in an

applicable rule or statute concerning interconnection and parallel operation of the DG, unless the Customer's installation is exempted from the change or the Customer complies with the change in a timely manner. Nothing in this provision shall limit the ability of the Company to disconnect the Customer without providing notice as specified herein if necessary to address a hazardous condition.

Upon termination of this Agreement the DG will be disconnected from the Company's electric system. The termination of this Agreement shall not relieve either Party of its liabilities and obligations, owed or continuing at the time of the termination.

14.0 Governing [Law/Regulatory Authority]

This Agreement was executed in the State of [name of State] and must in all respects be governed by, interpreted, construed, and enforced in accordance with the laws thereof. This Agreement is subject to, and the parties' obligations hereunder include, maintaining and operating in full compliance with all valid, applicable federal, state, and local laws or ordinances, and all applicable rules, regulations, orders of, and tariffs approved by, duly constituted regulatory authorities having jurisdiction.

15.0 Assignments

15.1 Assignment to Corporate Party

At any time during the term, the Customer may assign this Agreement to a corporation or other entity with limited liability, provided that the Customer obtains the consent of the Company. Such consent will not be withheld unless the Company can demonstrate that

the corporate entity is not reasonably capable of performing the obligations of the assigning Customer under this Agreement.

15.2 Assignment to Individuals

At any time during the term, a Customer may assign this Agreement to another person, other than a corporation or other entity with limited liability, provided that the assignee is the owner, lessee, or is otherwise responsible for the DG.

16.0 Confidentiality

[Provisions to be worked out between the Parties.]

17.0 Dispute Resolution

Each Party agrees to attempt to resolve all disputes arising hereunder promptly, equitably and in a good faith manner, consistent with applicable State regulatory commission rules regarding resolution of disputes.

18.0 Amendment and Notification

This Agreement can only be amended or modified by a writing signed by both Parties**.**

19.0 Entire Agreement

This Agreement constitutes the entire Agreement between the Parties and supersedes all prior agreements or understandings, whether verbal or written. It is expressly

acknowledged that the Parties may have other agreements covering other services not expressly provided for herein, which agreements are unaffected by this Agreement.

20.0 Non-Waiver

None of the provisions of this Agreement shall be considered waived by a Party unless such waiver is given in writing. The failure of a Party to this agreement to insist, on any occasion, upon strict performance of any provision of this agreement will not be considered to waive the obligations, rights, or duties imposed on the Parties.

21.0 No Third Party Beneficiaries

This agreement is not intended to and does not create rights, remedies, benefits of any character whatsoever in favor of any persons, corporations, associations, or entities other than the Parties, and the obligations herein assumed are solely for the use and benefit of Parties, their successors in the interest and, where permitted, their assigns.

22.0 Signatures

IN WITNESS WHEREOF, the Parties have caused this Agreement to be signed by their respective duly authorized representatives.

[COMPANY NAME]	[CUSTOMER NAME]
BY: _____	BY: _____
TITLE: _____	TITLE: _____
DATE: _____	DATE: _____

Exhibit A.1

Summary and Description of Interconnection as found in the

STANDARIZED APPLICATION FOR SINGLE PHASE ATTACHMENT OF PARALLEL GENERATION EQUIPMENT __ kW OR SMALLER TO THE ELECTRIC SYSTEM OF

Company:_____

DG Identification Number: _(Assigned by the Company)_

Customer:
Name: _____ Phone: (___)_____
Address:_____ Municipality: _____
_____

Customer's Electric Service Account Number: _(Assigned by the Company)__

Name and Address of the Customer as it appears on the Customer's electric service bill from the Company:
Name: _____ Phone: (___)_____
Address:_____ Municipality: _____
_____

Consulting Engineer or Contractor:
Name: _____ Phone: (___)_____
Address:_____
_____

Estimated In-Service Date: _____

Existing Electric Service:
Capacity: _____Amperes Voltage: _____Volts
Service Character: ( )Single Phase ( )Three Phase

Location of Protective Interface Equipment on Property:
(include address if different from customer address)
_____

Energy Producing Equipment/Inverter Information:
Manufacturer: _____
Model No. _____ Version No. _____
( )Synchronous ( )Induction ( )Inverter ( )Other_____
Rating: _____kW Rating: _____kVA
Generator Connection: ( )Delta ( )Wye ( )Wye Grounded
Interconnection Voltage: _____Volts
System Type Tested (Total System): ( )Yes ( )No; attach product literature
Equipment Type Tested (i.e. Inverter, Protection System):

( )Yes ( )No; attach product literature
One Line Diagram attached: ( )Yes
Installation Test Plan attached: ( )Yes

Signature:

CUSTOMER SIGNATURE TITLE DATE

Exhibit A.2

Summary and Description of Interconnection as found in the

STANDARIZED APPLICATION FOR ATTACHMENT OF PARALLEL GENERATION EQUIPMENT ___ kW OR SMALLER TO THE ELECTRIC SYSTEM OF

Company:_____

DG Identification Number: _(Assigned by the Company)_

Customer:
Name: _____ Phone: (___)_____
Address:_____ Municipality: _____
_____

Customer's Electric Service Account Number: _(Assigned by the Company)__

Name and Address of the Customer as it appears on the Customer's electric service Bill from the Company:
Name: _____ Phone: (___)_____
Address:_____ Municipality: _____
_____

Consulting Engineer or Contractor:
Name: _____ Phone: (___)_____
Address:_____
_____

Estimated In-Service Date: _____

Existing Electric Service:
Capacity: _____Amperes Voltage: _____Volts
Service Character: ( )Single Phase ( )Three Phase
Secondary 3 Phase Transformer Connection ( )Wye ( )Delta

Location of Protective Interface Equipment on Property:
(include address if different from customer address)
_____

Energy Producing Equipment/Inverter Information:
Manufacturer: _____
Model No. _____ Version No. _____
( )Synchronous ( )Induction ( )Inverter ( )Other_____
Rating: _____kW Rating: _____kVA
Rated Output: VA Rated Voltage: Volts
Rate Frequency: Hertz Rated Speed: RPM

Efficiency: % Power Factor: %
Rated Current: Amps Locked Rotor Current: Amps
Synchronous Speed: RPM Winding Connection:
Min. Operating Freq./Time:
Generator Connection: ( )Delta ( )Wye ( )Wye Grounded
System Type Tested (Total System): ( )Yes ( )No; attach product literature
Equipment Type Tested (i.e. Inverter, Protection System):
( )Yes ( )No; attach product literature
[Detailed] Diagram attached: ( )Yes
Installation Test Plan attached: ( )Yes

For Synchronous Machines:
Submit copies of the Saturation Curve and the Vee Curve
( )Salient ( )Non-Salient
Torque: _____lb-ft Rated RPM: _____
Field Amperes: _____ at rated generator voltage and current
and _____% PF over-excited
Type of Exciter: _____
Output Power of Exciter: _____
Type of Voltage Regulator: _____
Direct-axis Synchronous Reactance (Xd) _____ohms
Direct-axis Transient Reactance (X'd) _____ohms
Direct-axis Sub-transient Reactance (X"d) _____ohms

For Induction Machines:
Rotor Resistance (Rr)_____ohms Exciting Current ____Amps
Rotor Reactance (Xr)_____ohms Reactive Power Required:
Magnetizing Reactance (Xm)_____ohms ___VARs (No Load)
Stator Resistance (Rs)_____ohms ___VARs (Full Load)
Stator Reactance (Xs)_____ohms
Short Circuit Reactance (X"d)_____ohms Phases:
Frame Size: _____ Design Letter: ____ ( )Single
Temp. Rise: _____OC. ( )Three-Phase

For Inverters:
Manufacturer: Model:
Type: ( )Forced Commutated ( )Line Commutated
Rated Output: Amps Volts
Efficiency: %

Signature:

CUSTOMER SIGNATURE TITLE DATE

Exhibit B

Technical Definitions

- **Company** - An electric Company operating a distribution system.

- **Customer –** Any entity interconnected to the Company's Company system for the purpose of receiving [or exporting] electric power from [or to] the Company's Company system.

- **Distributed Generation ("DG") –** An electrical generating installation consisting of one or more on-site generating units. The total capacity of the aggregated generating units to be interconnected at any Point Of Common Coupling under this Agreement shall not exceed _____ kilowatts/[megawatts].

- **Force Majeure Event** - For purposes of this Agreement, a "Force Majeure Event" means any event: (a) that is beyond the reasonable control of the affected Party; and (b) that the affected Party is unable to prevent or provide against by exercising reasonable diligence, including the following events or circumstances, but only to the extent they satisfy the preceding requirements: acts of war, public disorder, insurrection, or rebellion; floods, hurricanes, earthquakes, lightning, storms, and other natural calamities; explosions or fires; strikes, work stoppages, or labor disputes; embargoes; and sabotage.

- **Indemnification –** Protection against or being kept free from loss or damage.

- **Interconnection** – The physical connection of distributed generation to the Company system in accordance with the requirements of this Agreement so that parallel operation can occur.

- **Interconnection Agreement ("Agreement")** – The standard form of agreement, which has been approved by the [State Regulatory Commission]. The Agreement sets forth the contractual conditions under which the Company and the Customer agree that DG may be interconnected with the Company's system.

- **On-site generating units (or distributed generation)** – For purposes of this Agreement, an electrical generating facility located at a customer's point of delivery (Point Of Common Coupling) of ___ kilowatts (kW)/[megawatts (MW)] or less and connected at a voltage less than 60 [or ___] kilovolts (kV) which may be connected in parallel operation with the Company system.

- **Standardized Application –** The standard application for interconnection and parallel operation with the Company system, approved by the State Regulatory Commission].

- **Company system –** A Company's distribution system below 60 kV to which the distributed generation equipment is interconnected.

Exhibit C

Allocation of Responsibility for the Design, Installation, Operation, Maintenance and Ownership of the Interconnection Facilities

[NOTE: *There can be significant state policy issues involved in the allocation of responsibilities that may vary from state to state. Exhibit C will allow each state to adopt its policy preferences on these issues.]*